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PREVALENCE AND CONTRIBUTING FACTORS OF MEDICATION ADMINISTRATION ERRORS AMONG NURSES IN TERTIARY CARE HOSPITALS IN PESHAWAR

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Abstract

Purpose: *The purpose of our study was to investigate the prevalence of medication administration errors among nurses and identify the contributing factors that affect nursing practice and patient safety. The study aimed to explore the relationship between workload, time constraints, training, and resources in relation to medication errors.*

Methodology: *A cross-sectional study was conducted among 250 nurses in various healthcare settings. The study collected quantitative data through structured questionnaires, which assessed the frequency of medication errors, the contributing factors, and the demographic details of the participants, such as age, years of experience, and educational background. Descriptive statistical analyses were used to identify significant trends.*

Results: *Our study results indicated that 27.3% of nurses reported administering the wrong drug, 24.9% used the wrong route, and 28.9% failed to verify patient identity. Additionally, 29.6% of nurses occasionally neglected documentation, and 31.6% did not verify unclear medication orders. Factors such as high workloads, time pressures, lack of resources, and insufficient training were identified as key contributors to these errors. our study found that younger nurses with less experience were more prone to making these mistakes.*

Conclusion: *Our study highlights the significant impact of systemic issues, including high workloads and inadequate training, on medication administration errors. Improving training, communication, adherence to protocols, and addressing environmental and resource-related barriers are essential to reducing medication errors and enhancing patient safety. our findings underscore the importance of organizational interventions and support systems in ensuring safe medication practices.*

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INTRODUCTION

1.1 Background

Any avoidable action that leads to improper medicine use during treatment and causes harm to the patient to the point of impairment or death is considered MAE. It has an impact on interpersonal relationships, jeopardizes confidence in the healthcare system overall, and has the potential to end lives. The 10 rights, the right patient, the right medication, the right time, the right amount, the right route, the right education or guidance, the right to reject, the right assessment, the right evaluation or response, and the documentation can all be violated when administering medication. When ordering, prescribing, dispensing, preparing, or administering medication, healthcare professionals made mistakes (2).

1.2 INTRODUCTION

In hospitals, nurses give patients their medications to keep them safe. As a result, there is a chance of making mistakes when giving medication. This procedure is directly linked to rates of morbidity and mortality and is essential for patient safety. Medication administration errors can put hospitalized patients at risk and raise medical expenses (7). Due to overlapping definitions, language related to medication errors can be confusing. The IOM defines a mistake in healthcare as "the use of a wrong plan to achieve an aim (error of planning) or the failure of a planned action to be completed as intended (error of execution)." Either an act of commission or an act of omission can constitute a mistake. "Any error occurring in the medication use process" is the definition of a medication error, which focuses on issues with a patient's medicine delivery. Crucially, while some pharmaceutical errors (such as "near misses") result in harm to the patient, the majority do not (5).

1.3 PATIENT SAFETY

One of the basic rights of patients is patient safety, which must be guaranteed throughout the delivery of healthcare (1). Globally, patient safety and avoidable patient injury are major concerns. The WHO launched the third global patient safety challenge in 2017 with the topic "Medication without Harm" in response to the high rate of medication errors. The challenge's objective is to decrease medication errors and enhance professional and institutional planning for safe practices (4). When nurses offer care with a good attitude, patient safety and safe procedures are guaranteed. Positive-minded nurses are always looking for exceptional nursing practice. However, nurses who view their work as "just a job" revealed a higher likelihood of making pharmaceutical mistakes (3).

1.4 MEDICATION ERRORS

The error of drugs (ME) is determined by the National Coordination Council on medicine errors and prevention as "any preventive event which can cause or cause poor consumption of drugs or prejudice to patients, while medicine controls the specialist doctor, the patient, or consumer "(8). Medication errors arise when weak drugs prescribe, transcription, dosage, introduction and surveillance, which can then lead to serious damage, a handicap and even death (13). speed and dates (3). One in three medication errors occurring in general practice are due to medication errors, many of which are due to poor communication. Medication errors contribute to adverse events that compromise patient safety and impose a significant financial burden on health systems (17). Medication errors can occur due to failure to adhere to any of the ten rights, namely: right patient, right medication, right time, right dose, right route, right education/counseling, right to refuse, right assessment, right response to assessment, and documentation (19). MAEs can be avoided through consistent reporting systems and by removing barriers to reporting errors, such as fear, heavy workload, time constraints, and employees' negative perceptions of errors (19). Several factors are associated with incomplete reporting of MAE errors, including personal fear of reporting an error, such as fear of facing litigation, lack of time to complete the report, and lack of knowledge that an error has occurred. Manager and coworker mistakes occur (20). Fear of nursing management is the main reason associated with underreporting of MAEs. Continuing education on the importance of reporting MAEs and maintaining an effective and realistic policy in a non-punitive environment has

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potential benefits in preventing the error from recurring and improving patient safety (20). MAEs are perpetrated by coming up with similar looking and sounding drug names, confusing and unclear labels, and misleading dosage packaging (21). Registered nurses frequently made medication errors due to factors such as workload, overtime, understaffing with poor support, and shift length. Lack of knowledge and incorrect dosage calculations contribute to medication errors. Medication calculation skills have been found to be a prerequisite for nursing registration and exams for learning abilities, rather than following a rigid protocol that hinders nurses' thinking skills. Furthermore, a focus on continuing education with clinical and theoretical support helps prevent medication errors (23).

1.5 EPIDEMIOLOGICAL STATISTICS REGARDING MEDICATION ERRORS

Medication errors are a global problem, 5.0% of which are fatal, of which approximately 50.0% are preventable (23). According to the World Health Organization (WHO), ME is among the top 10 leading causes of death and disability worldwide (1). The World Health Organization recognizes medication errors as the leading cause of healthcare-associated injuries, accounting for approximately $42 billion annually, or nearly 1% of total global healthcare expenditures. (18) In the United States, more than 7 million hospitalized patients suffer from medication errors (ME), and the costs of these errors are estimated at $40 billion annually. There are 2.37 million registered people with ME in the UK, representing an annual economic burden of £98.5 million. The situation is even worse in low- and middle-income countries (LMICs), with a population of over 134 million (1). It has been observed that 19% of medication errors in intensive care units (ICUs) are considered life-threatening and 42% are considered to require ongoing care (23). The most common errors were in outpatient departments (39.0-44.0%) and emergency departments (60.0-73.5%), whereas transcription errors were 16.9% and 13.8% for admitted and discharged patients, respectively, and discharge summary errors ranged from 16.0% to 36.0% (23). Nearly one-third of U.S. adults take five or more medications. Every year, the side effects of drugs are about 700,000 visits to the emergency department and 100,000 hospitalizations. Almost 5 % of inpatients have an adverse effect on drugs, making it one of the most common types of error in hospitalization (6). Depending on the Iranian context, 29.8%–47.8% of medication errors occur at the prescribing stage. 10.0%–51.8% of medication errors occur at the transcription stage, 11.3%–33.6% of medication errors occur at the dispensing stage, and 14.3%–70% of medication errors occur at the administration stage. Medication errors at the administration stage are the most common medical errors in clinical practice (53%). In Italy, 16.5% of medication errors occur at the prescription stage, 11% of medication errors occur at the transcription stage, and 13.5% of medication errors occur at the delivery stage (9). Medication errors are the leading cause of medical malpractice in Australia (26% of 27,000 medication incidents) (14), and in Finland, between 700 and 1,700 people die each year as a result of medication errors (19). Medication errors were common, with one error occurring for every five doses of medication administered. Additionally, the most common errors were incorrect timing (43%), omission (30%), incorrect dose (17%), and unauthorized medication (4%). Errors deemed potentially dangerous amounted to 7%. The problem of "faulty drug administration systems" was common in these hospitals. Jordanian nurses reported remembering making up to six errors during their nursing careers. Similarly, American nurses reported five errors throughout their nursing careers (15). (a) Prescription errors. These were presented as: drug interactions (68.2%), incomplete prescription (25.0%), monitoring (12.6%), incorrect dosing (13.0%), underdosing (12.6%), incorrect dosing interval (12.6%), 0%), and overdose (7.0%). (b) Nursing errors. These were presented as: wrong rate (34.0%), wrong administration time (28.6%), wrong dose (25.3%), forgotten medication (24.0%), wrong liquid (22.4%), wrong medication (21.1%), wrong route (19.9%), and wrong patient (19.7%). (c) Pharmacist errors, such as incorrect dosing (25.0%), excessive dose (23.0%), mislabeling (23%), incorrect medication administration (21.8%), wrong dose (10.8%), wrong quantity (6.9%), and incorrect direction of administration. Release (2.3%). Errors

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in dosing and administration are considered common and may account for up to 65.0–87.0% of medication errors (23). Errors were recorded in medication administration (33.0%), documentation (23.0%), medication dispensing (22.0%), medication administration (21.0%), and follow-up (1.0%). Errors also included omission (25.0%), dosage (30.0%), unauthorized medication, incorrect timing, patient, and method of administration. (23) ME is a leading cause of preventable patient harm in healthcare systems worldwide. MES is the main cause of avoidable patients in healthcare systems around the world. 39 % of MES occurs among general practitioners, 38 % are nurses and 23 % are pharmacists. prevalence of MEs among nurses is between 16 and 27% (16). Medication administration errors cause the death of one person every day and injure approximately 1.3 million people in the United States of America alone each year. Some studies have reported incidence rates in developed countries to be 10%, 19.5%, and 22.2%, respectively (21).

1.6 Pharmaceutical safety strategy

Nurses are particularly indispensable for these errors, and in most cases, they find a way to reduce the danger of drug errors by directly looking at drug errors. Their rare positions are regularly enhanced by continuous learning about drugs to verify the effects of treatment, in addition to drug planning and management strategies. All nurses should be familiar with different methodologies to prevent or decrease the likelihood of medication errors (23). Some techniques to follow include:

1.6.1 Ensuring the five privileges of the prescribing organization

Nurses should ensure that the institutional approaches identified with the interpretation of prescriptions are followed. However, the appropriate patient, the right timing, and the appropriate drug recommended for appropriate measures are effectively planned (otherwise called five rights) It is not enough to simply translate the prescribed medicine just by guaranteeing (23). Nurse is a medical expert who administers drugs to patients (4).

1.6.2 Get a doctor (or another nurse) to read it again

This is the procedure where the nurse reviews the request to the recommended physician to ensure that the prescribed medication is transcribed correctly. This procedure can start with one nurse and then another. The nurse reviews the request that the physician transcribed to another nurse, while the MAR is reviewed to ensure accuracy (23).

1.6.3 Document everything

Nurses play a key role in promoting patient safety (3). This includes clear documentation or proper records of the legal names of medicines and what medicines are prescribed. Without proper documentation on prescriptions, errors can occur: For example, if a nurse fails to report a required prescription, another provider may order a different dose because there is no documentation showing past administration. Another good practice is to look at the name/label of the medication and its expiration date. The correct prescription may be mislabeled or vice versa, which can also lead to medication errors (23).

1.6.4 Know your facility's policies, regulations, and guidelines

Nurses should be familiar with policies and guidelines and how they apply because these regulations and policies may provide necessary information regarding ordering, transcribing, administering, and documenting medications. Additionally, nurses can be provided with information about black box warnings, which have similar appearance, sound, and warning labels (23).

1.7 PROBLEM STATEMENT

Medication administration errors (MAEs) are a widespread and preventable issue in healthcare settings that threaten patient safety, contribute to avoidable harm and death, and result in significant healthcare costs. Despite the availability of preventive strategies, factors like systemic inefficiencies, human error, lack of proper training, and fear of reporting contribute to the persistence of these errors. There is a need for improved safety systems, reporting mechanisms, and education to mitigate the occurrence of MAEs and ensure better patient care.

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1.8 SIGNIFICANCE OF THE STUDY

The significance of this study lies in its potential to reduce medication errors, improve patient safety, lower healthcare costs, enhance the quality of care, and foster a culture of safety in healthcare settings. The insights and recommendations derived from the study will help healthcare professionals, policy makers, and institutions implement effective strategies and systems to prevent medication errors, ultimately improving patient outcomes worldwide.

1.9 GAP OF THE STUDY

The gap of the study exists in areas such as understanding the complex and multifactorial causes of medication errors, improving reporting and cultural safety, addressing specific challenges with high-alert medications, evaluating existing safety protocols and training, exploring the impact of technology, and examining how environmental and contextual factors contribute to errors. By addressing these gaps, the study can contribute to a deeper understanding of medication administration errors and offer targeted solutions to improve patient safety and healthcare delivery worldwide.

1.10 RESEARCH QUESTION

1. What is the prevalence of medication administration errors among nurses in Peshawar?
2. What are the contributing factors associated with medication administration errors in nursing practice in Peshawar?

1.11 OBJECTIVES OF THE STUDY

1.To determine the prevalence of medication administration errors among nurses in Peshawar.
2.To identify the contributing factors associated with medication administration errors in nursing practice in Peshawar.

LITERATURE REVIEW

This literature review seeks to provide an in-depth examination of the key studies on medication errors in nursing practice, focusing specifically on the prevalence of errors, the individual and organizational contributing factors, and the preventive strategies recommended to reduce these errors. The goal is to contextualize the findings from these studies within the broader scope of nursing practice and patient safety, highlighting the need for ongoing efforts to improve medication safety in nursing.

2.1 Background of literature review:

Any avoidable action that leads to improper medicine use during treatment and causes harm to the patient to the point of impairment or death is considered MAE. It has an impact on interpersonal relationships, jeopardizes confidence in the healthcare system overall, and has the potential to end lives. The 10 rights the right patient, the right drug, the right time, the right amount, the right route, the right education or guidance, the right to reject, the right assessment, the right evaluation or response, and the proper documentation can all be violated when administering medication. When ordering, prescribing, dispensing, preparing, or administering medication, healthcare professionals (1).

A 298 randomly chosen nurses participated in a cross-sectional study in Addis Ababa, Ethiopia. In order to gather information through self-reporting and direct observation of nurses giving medication, we used a self-administered survey questionnaire and checklist. Five percent of the study participants tested the tools after they were assessed by experts. According to the study's findings, 298 nurses, or 98.3% of the total, answered the survey. 203 (68.1%) of them admitted to making mistakes when administering their medications within the preceding 12 months. Significant predictors of medication administration errors at p-value < 0.05 included factors like inadequate training [AOR = 3.16; 95% CI (1.67,6)], lack of a medication administration guideline [AOR = 2.07; 95% CI (1.06,4.06)], inadequate work experience [AOR = 6.48; 95% CI (1.32,31.78)], interruption during medication administration [AOR = 2.42, 95% CI (1.3,4.49)], and night duty shift [AOR = 5, 95% CI (1.82, 13.78)].According to the study's findings, preventing medication administration errors is difficult yet essential for patient safety. offering ongoing instruction on how to safely administer medications, establishing a medication administration guideline that nurses can use, Improving the quality and safety of drug administration may include hiring more experienced nurses and fostering an environment

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that allows nurses to securely dispense medications (22).

A cross-sectional, correlational study was conducted in Finland. Data were collected from nurse managers (n = 29), nursing staff (n = 306) and patients (n = 651) from 28 units in three Finnish acute care hospitals between April and November 2017. Also, data regarding medication errors (n = 29). 468) during one calendar year (2017) were obtained from the hospital incident reporting register. According to the results of the study, several relationships were identified between the professional activities of nurse managers, the job satisfaction of nurses, patient satisfaction and medication errors. The professional activities of nurse managers had positive and negative relationships in other studied variables. The factors of job satisfaction ($p < 0.001$), overall patient satisfaction ($p < 0.001$) and medication errors ($p < 0.001$) were identified as the variables most affected by other factors. This study concluded that nurse managers need to focus on improving nursing practices by managing and organizing the work of nurses in such a way that their employees feel supported, motivated and safe. Additionally, nurse managers should adopt a leadership style that emphasizes safe, patient-centered care. The findings also suggest that the management of today's healthcare organizations should actively evaluate the role of nurse managers in work activities to ensure that their daily work is aligned with organizational goals (30).

A 5-year cross-sectional study was conducted in Australia. According to the results of the study, the incidence of EM was 1.05 per 100 admitted patients. The highest frequency of errors is observed during the coldest months from May to August. Check the data by day of the week, Monday and Tuesday have the highest frequency of errors. French When broken down by time of day, the time intervals from 7 am to 8 pm showed a large increase in error frequency. One thousand eighty-eight (57.8%) EMs belonged to the Incident Severity Index (ISR) level 4 and 787 (41.8%) to the ISR level 3. Six Level 2 ISR incidents and only one Level 1 ISR incident were reported during the five-year period 2014-2018. Administration errors were the most common, with 1070 errors (56.8%), followed by prescription errors (433, 23%). High-risk medications were associated with half the number of errors, with the most common being narcotics (17.9%) and antimicrobials (13.2%). This study concluded that EM continues to be a problem for hospitals internationally. Inexperience of healthcare professionals and nurse/patient ratios may be the main challenges to overcome. Specific training of new staff in prescribing and administering medications and managing nurse workload may be possible solutions to reduce ME in hospitals (27).

A survey-based study was conducted in the United States. A random sample of 2,500 members of the American Association of Critical Care Nurses was recruited to participate in the study. The criteria of interest were general health status, symptoms of depression and anxiety, stress, burnout, perceived support for well-being at work, and medical errors. According to the study results, a total of 771 critical care nurses participated in the study. Nurses in poor physical and mental health reported significantly more medical errors than nurses in better health (odds ratio [95% CI]: 1). 31 [0.96-1.78] for physical health, 1.62 [1.17-2.1 29] for depressive symptoms). Nurses who felt that their workplace was very supportive of their well-being were twice as likely to have better physical health (odds ratio [95% CI], 2.16 [1.33-3.52] 55. 8%). This study concluded that hospital and health system leaders should prioritize the health of their nurses by addressing system issues, creating a culture of wellness, and providing evidence-based support and wellness programs, which will ultimately increase the quality of patient care and reduce the incidence of preventable medical errors (29).

A multicenter, cross-sectional, descriptive study was conducted from September to December 2022 in Iran. The study population included nursing students from three universities of medical sciences in Fars province, southern Iran. A total of 310 nursing students selected by convenience sampling participated in the study. Data collection instruments included a demographic survey, the Medication Safety Competencies Scale (MSCS), and the Safe Nursing Care Scale (SNCS). According to the study results, the average age of the participants was 22 years. 53±1.69 years. The mean total scores for medication safety and safe nursing competence were 111.97±11.85 and 105. 12±11.64, respectively.

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There was a statistically significant positive correlation between safe nursing care and medication safety competency (r = 0.084, P < 0.001). This study concluded that the mean scores of nursing students in medication safety and safe nursing care were at an average level. To maintain patient safety, nurse educators and managers are advised to use appropriate strategies to improve medication safety and safe nursing care competence among nursing students (28).

A cross-sectional study was conducted in Israel and examined three main variables: medication errors, workload, and availability of medical information, comparing two periods - before and after the implementation of self-reported EMRs. A final sample of 591 Israeli nurses was recruited using private online social media groups to complete a structured online questionnaire. The questionnaires included items assessing workload (using the Expanded Nursing Stress Scale), availability of medical information. According to the study results, nurses perceive EMR to reduce the magnitude of medication administration errors (mean difference = -0.92±0.90SD, p<0.001), as well as workload (mean difference = -0.83±1.00). 03SD, p<0.001) by approximately 30% on average, each. At the same time, the systems are perceived to require more documentation time at the expense of patient treatment time, and can hinder the availability of medical information by approximately 10% on average. This study concluded that nurses perceived the importance of EMR systems in reducing medication errors and facilitating their work. Despite generally positive attitudes toward EMR systems, nurses also reported that they reduced the availability of information compared to the paper-and-pencil approach. It is necessary to improve systems in terms of planning and adaptation in the field and providing adequate technical and educational support to the nurses who use them (10).

A Publications from 2000 to February 2019 were examined using four electronic databases. Inclusion criteria were articles that (1) presented results from studies using a qualitative or mixed design, (2) reported qualitative data on nurse-perceived causes of major adverse health events in the settings of health care, and (3)) were published in English. Sixteen individual articles met the inclusion criteria. The methodological quality of each article was assessed using the Critical Appraisal Skills Programmed (CASP) tool. A thematic analysis of the data was conducted. The perceived causes of errors were categorized as knowledge-based, personal, and contextual factors. According to the study results, the main knowledge-based factor was lack of knowledge about medications. Personal factors included fatigue and complacency. Contextual factors included heavy workloads and interruptions. Contextual factors were reported in all reviewed studies and were often correlated with personal and knowledge-based factors. The study concluded that the causes of major adverse events are perceived by nurses as multifactorial and interrelated and often arise from systemic issues. Multifactorial interventions are needed to mitigate medication errors with a focus on systemic changes. The results of this review can be used to guide efforts to identify and modify factors that contribute to major adverse events (26).

A descriptive correlational design was conducted in Indonesia and used samples obtained from 164 nurses through a purposive sampling technique. The inclusion criteria for the sample were nurses working in patient rooms, who were healthy and not sick, who were not currently in school, and who were willing to respond. In addition, the research instruments were questionnaires, which were developed based on Cronbach's alpha validity and reliability test results of 0.681 and 0.873, respectively. According to the results of the study, the results showed that the factors that influenced the incidence of medication errors were professional experience, motivation, workload, managerial and environmental elements. Furthermore, the variable that contributed the most, with a p-value of 0.004 and an OR of 5.387, was workload. This study concluded that ultimately, the following factors, including nurse workload, motivation, professional experience, good managerial management, and environmental elements, should be considered to prevent medication errors (7).

A cross-sectional study was conducted in Ethiopia and 422 participants were selected using simple random sampling method. Data were collected using a semi-structured, pre-tested self-administered questionnaire and an observation checklist. According to the study results, 414 participants with

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a response rate of 98.1% were included and 54.3% were women. The median age was 30 years with an IQR of (28-34) years and most of them (83.8%) had a bachelor's degree in nursing. The prevalence of EAM in this study was 57.7% and 30.4% of them had done it more than three times. The most common medication administration errors were incorrect timing (38.6%), incorrect assessment (27.5%), and incorrect assessment (26.1%). Significant association between medication administration errors and lack of training [AOR = 2. 20; 95% CI (1.09, 4.46)], unavailability of guidelines [AOR = 1.65; 95% CI (1.03, 2.46)]. 79)], poor communication when faced with a problem [AOR = 3.31; 95% CI (2.04, 5.37)], intercept [AOR = 3.37, 95% CI (2.04, 5.37)]. 15, 5.28)] and non-compliance with drug administration rights [AOR = 1.647; 95% CI (1.00, 2.49)] was found. French This study concluded that MAE was high in the study area compared to studies of Jimma University Specialist Hospital, Adigrat and Mekelle University Hospital and Gondar University Referral Hospital and therefore it is better to develop guidelines, provide training and develop strategies to minimize distractions. A cross-sectional study was conducted in a tertiary care hospital in Karachi among 120 nurses from January 2024 to March 2024. The sample size was calculated by Open EPI Softer considering a confidence level of 95% and a margin of error of 5%. According to the results of the study, 14 (12%) of the participants had a low level of knowledge and 37 (31%) had a moderate level of knowledge, while 69 (57%) had a high level of knowledge regarding medication errors. This study concluded that most nurses had a high level of knowledge about medication errors (25).

2.2 Gaps on the literature review:

The chapter will also highlight gaps in the current literature and suggest areas for future research to enhance the understanding and prevention of medication errors in nursing. By synthesizing findings from diverse settings, this review will provide a comprehensive understanding of the complexities surrounding medication errors and their prevention, with a focus on improving patient safety within nursing practice.

METHODOLOGY

The **methodology section** of a research study is crucial because it outlines the systematic approach that researchers will use to collect, analyze, and interpret data. It serves as the blueprint for how the study will be conducted, ensuring that the research is both valid and reliable. The methodology section justifies the choices made in terms of research design, data collection tools, and sampling techniques, and it helps readers understand how the study will answer the research questions or test hypotheses. A well-structured methodology allows for the reproducibility of the study, enabling other researchers to replicate the research in different settings or populations, thus confirming the results or identifying potential inconsistencies. In the context of your study, the methodology section will clarify how the research objectives will be met and why specific methods were chosen to address the problem of medication administration errors among nurses.

The **research title** of our study **"Prevalence and Contributing Factors of Medication Administration Errors among Nurses in Tertiary Care Hospitals in Peshawar"** addresses a critical issue in healthcare that can have significant implications for patient safety. Medication errors are a leading cause of preventable harm in clinical settings, and nurses, as primary healthcare providers, play a pivotal role in medication administration. The purpose of this research is to assess the frequency of such errors in Peshawar's tertiary care hospitals and identify the factors that contribute to these mistakes. By identifying these factors, the study aims to provide evidence that can inform interventions to improve medication safety practices. Understanding the prevalence and root causes of medication errors in this specific region is essential for healthcare policy makers, hospital administrators, and educators to develop effective strategies that enhance the quality of care and reduce the risks of harm to patients. The methodology section will ensure that the research is conducted in a systematic way to generate reliable and actionable insights for improving nursing practice and patient safety.

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3.0 Material and Methods

3.1 Study Design:

This research employs a **cross-sectional study design** to assess the prevalence of medication administration errors among nurses working in tertiary care hospitals in Peshawar. A cross-sectional design is appropriate for this type of study as it allows for the collection of data at a single point in time, enabling researchers to identify the frequency of medication administration errors across different nursing departments and hospital. This design also facilitates the exploration of potential contributing factors associated with these errors, providing a snapshot of the issue with in a specific population and setting.

3.2 Study Setting:

The study will be conducted in tertiary care hospitals located in Peshawar, which serve as the primary healthcare providers in the region. These hospitals offer a range of services, including emergency care, intensive care, general wards, pediatric care, and outpatient services. Given the complexity of care in these settings, including a diverse range of patients and conditions, the hospitals provide a relevant context to study medication administration practices among nurses.

3.3 Sample size and sampling techniques:

The target sample size for this study is **250 nurses.** The sample size was chosen based on the need for a statistically significant representation of nurses from various hospital departments, ensuring the study results reflect the diversity of nursing practice and experiences in medication administration. A sample of this size also provides sufficient power to detect meaningful differences and trends within the data. A **non-probability convenient sampling technique** will be employed to select participants. This technique is suitable for the study due to practical constraints, such as time, resources, and accessibility of nurses in the hospital setting. Convenient sampling allows researchers to select nurses who are readily available and willing to participate in the study, ensuring a feasible approach to data collection. While this method may introduce some bias, it is justified given the exploratory nature of the research and the lack of a comprehensive registry of nurses in the hospitals.

3.4 Inclusion and Exclusion Criteria:

3.4.1 Inclusion Criteria:

- Registered nurses who are actively working in tertiary care hospitals in Peshawar.
- Nurses with at least 6 months of experience in medication administration, as the study aims to gather insights from nurses who are familiar with routine medication practices and are likely to have encountered medication administration errors.
- Nurses working across a variety of departments, including emergency, ICU, general wards, pediatric wards, and outpatient departments. This inclusion ensures that a broad range of experiences is captured, as each department presents unique challenges and practices in medication administration.

3.4.2 Exclusion Criteria:

- Nursing students or trainees who have not yet assumed responsibility for medication administration in clinical settings.
- Nurses employed in administrative, research, or educational roles who do not regularly engage in direct patient care or medication administration.
- Temporary or rotational nurses who may not be sufficiently familiar with the specific protocols and procedures in the hospital where the study is being conducted.
- Nurses with less than 6 months of experience in medication administration, as they may not have sufficient exposure to medication-related tasks to provide reliable insights for the stud

3.5 Data Collection Tool:

The data will be collected using a tool developed by **Fogarty and McKeon (2006)**, which assesses the frequency of medication errors and the conditions under which nurses may "bend the rules" in medication administration. The tool focuses on the "five rights" of medication administration: right patient, right drug, right dose, right route, and right time. This instrument is well-suited for evaluating the key areas in which errors may occur and the factors contributing to these errors. It has been validated in previous studies, demonstrating its reliability and relevance to assessing medication error practices among nurses. The tool will include both closed and open-ended questions, enabling the collection of quantitative data (e.g., frequency of

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errors) as well as qualitative insights into the contributing factors and circumstances that may lead nurses to deviate from standard protocols.

3.6 Data Collection Procedure:

Data will be collected through **self-reported questionnaires** distributed to eligible nurses in the participating hospitals. Nurses will be asked to complete the questionnaire in a private setting to ensure confidentiality and minimize any potential biases related to social desirability. The study will be explained to each participant, and informed consent will be obtained before participation. Nurses will be assured of the anonymity of their responses and informed that participation is voluntary, with no impact on their professional standing or employment.

3.7 Data Analysis:

The data collected will be analyzed using **descriptive statistics** to determine the prevalence of medication errors. Frequencies and percentages will be used to summarize the types of errors reported by nurses, as well as the contributing factors identified.

3.8 Ethical Considerations:

Ethical considerations are critical in ensuring that the rights and well-being of participants are protected throughout the research process. In this study, informed consent will be obtained from all participants, ensuring that nurses fully understand the purpose of the study, the procedures involved, and any potential risks or benefits. Participants will be informed that their involvement is voluntary and that they can withdraw from the study at any time without any negative consequences to their professional standing or employment. To safeguard confidentiality, the study will ensure that no personally identifiable information is collected, and all responses will be anonymous. Nurses will be assigned a code or identifier number for data collection, and access to the data will be restricted to authorized research personnel only, maintaining the privacy and security of participants' responses.

RESULTS

4.1 DEMOGRAPHIC DATA OF PARTICIPANT

4.1.1 AGE

The participants' ages ranged from a minimum of 23 years to a maximum of 44 years, with a mean age of 29 years and a standard deviation of 3.21. The mean age indicates that most participants are relatively young, with an average age of around 29 years. The age range of 23 to 44 years suggests a mix of early-career and mid-career nurses, which could reflect a range of experiences, but the relatively young age of the majority indicates that the sample is likely to consist of more recent graduates or nurses who have not yet reached senior positions. The standard deviation of 3.21 indicates that most participants' ages are close to the mean, with little variance.

TABLE NO 01: AGE OF THE PARTICIPANTS

AGE	N	Minimum	Maximum	Mean	St. Deviation
	251	23.00	44.00	29.0797	3.20774

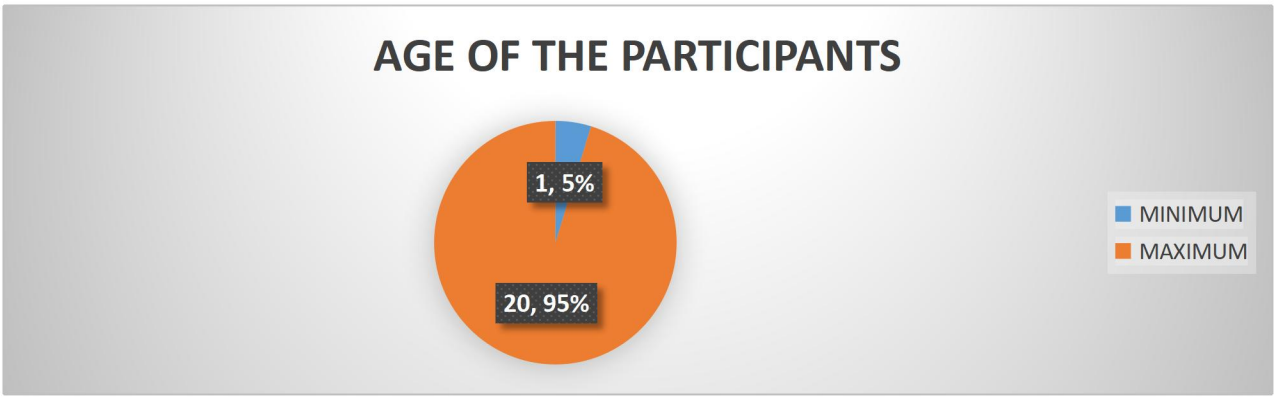

Figure No 1: Age Of The Participants

TABLE NO O2: YEARS OF EXPERIENCE

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Years of experience	N	Minimum	Maximum	Mean	St. Deviation
	251	1.00	20.00	4.6215	2.32641

4.1.2 YEARS OF EXPERIENCE

The years of experience among the participants ranged from a minimum of 1 year to a maximum of 20 years, with a mean of 4 years and a standard deviation of 2.33. The mean years of experience of 4 indicates that the majority of nurses in this study are relatively early in their careers, with less than five years of experience. This is supported by the fact that the years of experience range from just 1 year to a maximum of 20 years, showing that while the majority are relatively inexperienced, there are still some nurses with substantial experience. The standard deviation of 2.33 suggests that there is a moderate spread in the experience levels, meaning that some nurses have more experience, while others are still in the early stages of their careers.

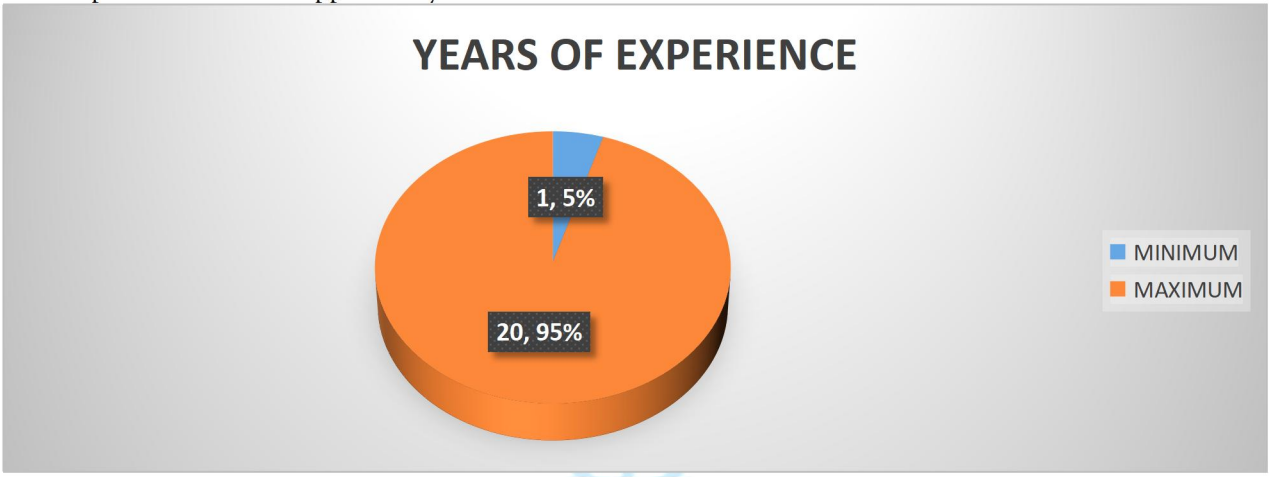

Figure No 2: Years Of Experience

TABLE NO O3: QUALIFICATION

Qualification	Frequency	Percent
Post RN	61	24.1
BSN	177	70.0
MSN	14	5.5
Total	252	99.6
Missing	1	0.4
Total	253	100.0

4.1.3 QUALIFICATION

Post RN (24.1%): These are nurses who have completed a registered nursing program and then pursued additional education or certifications, but they do not hold a Bachelor's of Science in Nursing (BSN). This group is a small portion of the sample. **BSN (70.0%)**: The largest proportion of nurses (70%) have completed a Bachelor's of Science in Nursing. This suggests that the majority of nurses in this sample have a formal undergraduate education in nursing, which is the most common level of qualification for nurses today. **MSN (5.5%)**: A small proportion (5.5%) hold a Master's in Science in Nursing, indicating that only a few nurses in this sample have advanced their education beyond a BSN. **Missing Data**: 1 participant (0.4%) did not provide information on their qualification. The data reveals a predominance of nurses with a BSN qualification, which reflects the growing trend toward higher educational standards in nursing. The relatively small proportion of nurses with a Post RN qualification and an MSN suggests that the sample mainly consists of nurses who are at the bachelor's level, with fewer pursuing advanced degrees.

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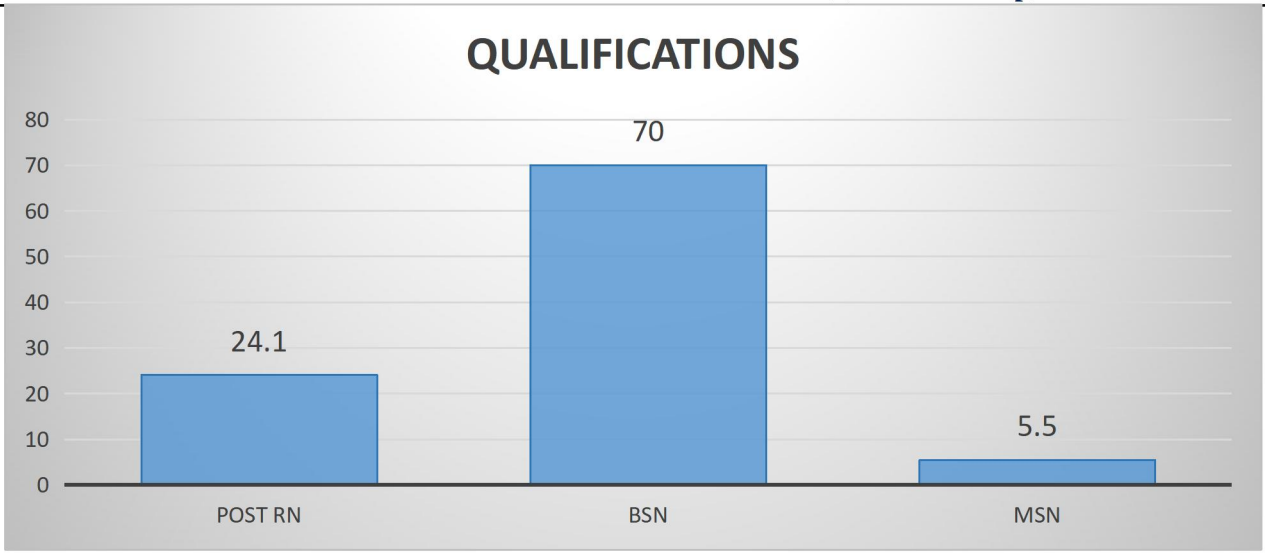

Figure No 3: Qualification

4.2.1 To the best of your knowledge, in the last 12 months, have you ever mistakenly done any of the following when administering a medication?

TABLE NO 04: Given the wrong drug

Given the wrong drug		Frequency	Percent
	Never	141	55.7
	Once or twice	69	27.3
	Three or four times	30	11.9
	More Often	13	5.1
	Total	253	100.0

4.2.1 Given the wrong drug

A significant portion of nurses (55.7%) reported never giving the wrong drug, but nearly a third (27.3%) admitted to doing so once or twice. This suggests that medication errors due to drug misadministration are relatively common, though not widespread. Contributing factors could include distractions, lack of focus, or working under pressure, which are factors often associated with clinical settings in Peshawar.

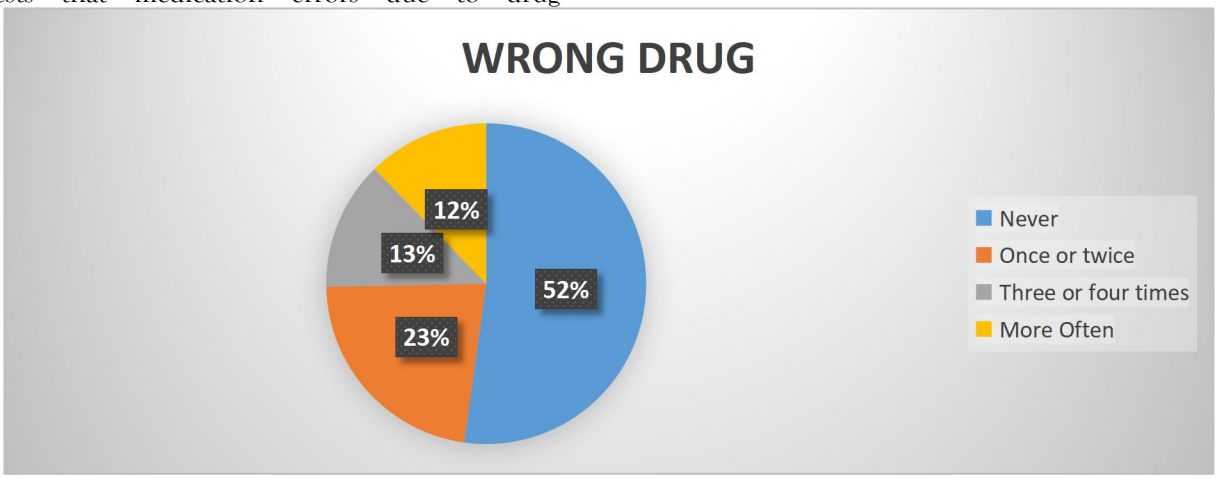

FIGURE NO O4: Given the wrong drug

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TABLE NO 05: By the wrong route

By the wrong route		Frequency	Percent
	Never	132	52.2
	Once or twice	63	24.9
	Three or four times	49	19.4
	More Often	9	3.6
	Total	253	100.0

4.2.2 By the wrong route

More than half (52.2%) of nurses have never given a medication by the wrong route, but almost 25% have done so once or twice, which is concerning. Medication errors of this type may occur due to time constraints or a lack of familiarity with drug administration routes, possibly influenced by inadequate training or high workload in Peshawar hospitals.

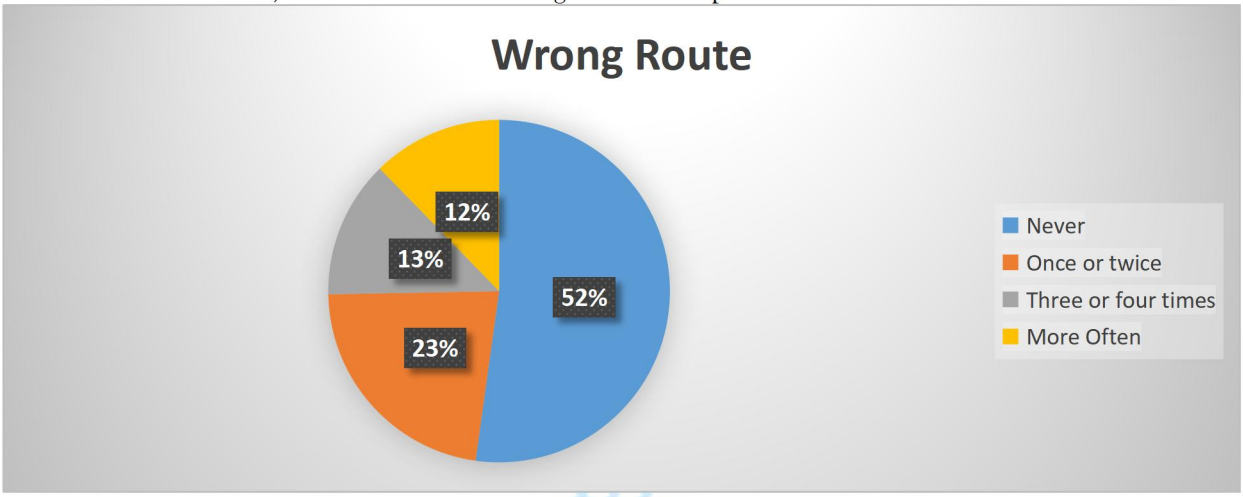

FIGURE NO 05: By the wrong route

TABLE NO 06: To the wrong patient

To the wrong patient		Frequency	Percent
	Never	122	48.2
	Once or twice	66	26.1
	Three or four times	45	17.8
	More Often	20	7.9
	Total	253	100.0

4.2.3 To the wrong patient

Almost half (48.2%) of nurses reported never giving medication to the wrong patient. However, a substantial number admitted to doing so once or twice, indicating a need for improved patient identification protocols. In Peshawar, where patient flow may be high, failure to double-check patient identities may be a contributing factor.

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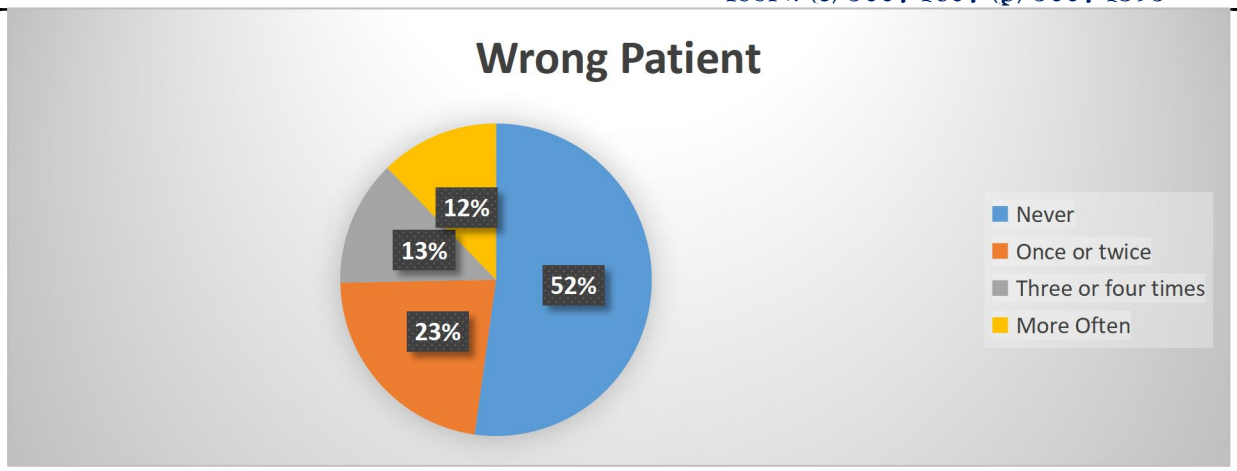

FIGURE NO 06: To The Wrong Patient

TABLE NO 07: At the wrong dose

At the wrong dose		Frequency	Percent
	Never	132	52.2
	Once or twice	57	22.5
	Three or four times	33	13.0
	More Often	31	12.3
	Total	253	100.0

4.2.4 At the wrong dose

Over half (52.2%) of respondents reported never giving the wrong dose, but 12.3% reported giving the wrong dose more frequently. This suggests that medication dosage errors, while not the most common, still pose a significant risk. Factors like improper drug calculations, unfamiliarity with medication dosages, or insufficient training could contribute to this.

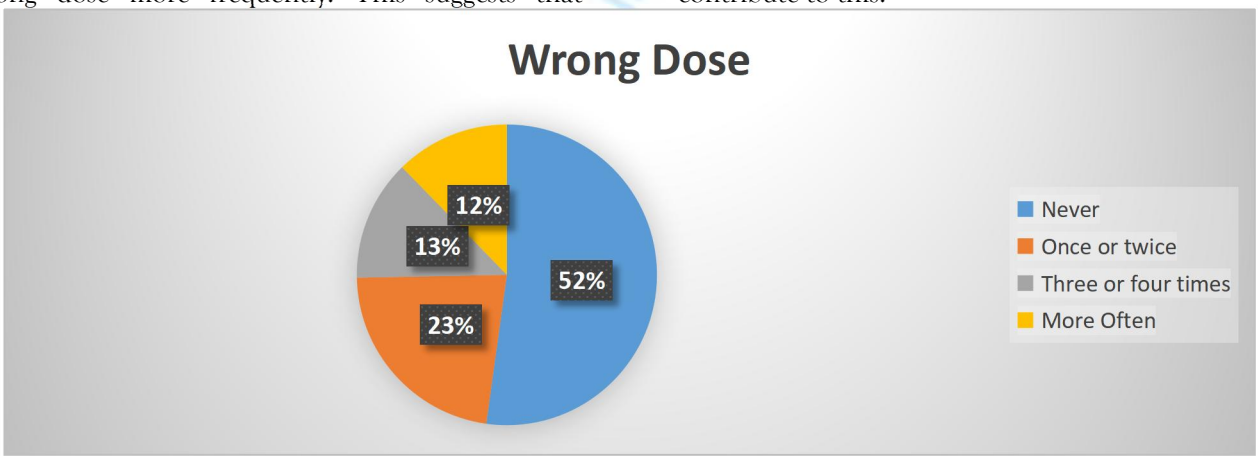

FIGURE NO 07: At the wrong dose

4.3 Please indicate how often in the past 12 months you have had to bend the rules in the following ways when administering a medication:

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TABLE NO 08: Did not verify with a doctor, an order that was illegible, unclear, incomplete, or that seemed inappropriate or unreasonable for the patient.

Did not verify with a doctor, an order that was illegible, unclear, incomplete, or that seemed inappropriate or unreasonable for the patient.		**Frequency**	**Percent**
	Never	99	39.1
	Sometimes	80	31.6
	Often	30	11.9
	Frequently	30	11.9
	Most of the time	14	5.5
	Total	253	100.0

4.3.1 Did not verify with a doctor, an order that was illegible, unclear, incomplete, or that seemed inappropriate or unreasonable for the patient.

This shows that a considerable proportion of nurses (39.1%) never fail to verify unclear or incomplete orders, which is a good sign. However, 31.6% sometimes or often engage in this practice, which is concerning. Rule-bending like this may happen due to heavy workloads, lack of communication, or insufficient time to clarify orders with doctors.

TABLE NO 09: Did not obtain the proper authority (e.g., order from doctor or signed protocol).

Did not obtain the proper authority (e.g., order from doctor or signed protocol).		Frequency	Percent
	Never	71	28.1
	Sometimes	84	33.2
	Often	46	18.2
	Frequently	24	9.5
	Most of the time	28	11.1
	Total	253	100.0

4.3.2 Did not verify with a doctor, an order that was illegible, unclear, incomplete, or that seemed inappropriate or unreasonable for the patient.

This suggests a significant portion of nurses sometimes or often bypass formal procedures, such as not obtaining necessary orders or signed protocols. Lack of resources, unclear hospital policies, or urgency may influence these decisions.

4.3.3 Did not complete appropriate documentation.

Documentation is crucial for tracking patient care, but many nurses reported not completing it adequately. This could be due to high patient turnover, time pressure, or understaffing, which are common challenges in healthcare settings in Peshawar.

TABLE NO 10: Did not complete appropriate documentation.

Did not complete appropriate documentation.		Frequency	Percent
	Never	49	19.4
	Sometimes	75	29.6
	Often	63	24.9
	Frequently	34	13.4
	Most of the time	32	12.6
	Total	253	100.0

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TABLE NO 11: Did not verify a verbal/telephone order and its transcription according to hospital policy.

Did not verify a verbal/telephone order and its transcription according to hospital policy.		Frequency	Percent
	Never	73	28.9
	Sometimes	75	29.6
	Often	49	19.4
	Frequently	35	13.8
	Most of the time	21	8.3
	Total	253	100.0

4.3.4 Did not verify a verbal/telephone order and its transcription according to hospital policy.

Nearly 29% of nurses reported never failing to verify verbal or telephone orders, which is good practice. However, 29.6% sometimes or often skip this important verification step, which could result in misunderstandings, incorrect medication administration, or even patient harm. This might occur due to time constraints, busy hospital environments, or lack of communication between the nursing staff and physicians. Given the healthcare context in Peshawar, these errors could be exacerbated by resource shortages or staffing challenges.

TABLE NO 12: Did not check reference material (e.g., MIMS) when unsure about or unfamiliar with medication.

Did not check reference material (e.g., MIMS) when unsure about or unfamiliar with medication.		Frequency	Percent
	Never	75	29.6
	Sometimes	58	22.9
	Often	45	17.8
	Frequently	56	22.1
	Most of the time	19	7.5
	Total	253	100.0

4.3.5 Did not check reference material (e.g., MIMS) when unsure about or unfamiliar with medication.

This shows that many nurses, despite feeling unsure or unfamiliar with medications, do not always check reference material. Inadequate access to resources, pressure to administer drugs quickly, or lack of confidence may contribute to this behavior.

4.3.6 Did not check for allergies or previous adverse reactions.

A substantial portion of nurses (24.1%) frequently failed to check for allergies or adverse reactions, with many others doing so sometimes or often. Failing to check this critical information can lead to serious patient safety issues, such as allergic reactions or side effects. Factors contributing to this include time pressures, high patient loads, or a lack of easy access to allergy records in some clinical settings. In Peshawar, where resources may be limited, healthcare professionals might face difficulties in accessing complete and up-to-date patient histories.

4.3.7 Did not monitor the effects of the drug after administration.

Monitoring the effects of medications is essential, but a significant portion of nurses sometimes or frequently fail to do so. Factors like workload, understaffing, or lack of training may hinder proper monitoring in the clinical environment.

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TABLE NO 13: Did not check for allergies or previous adverse reactions.

Did not check for allergies or previous adverse reactions.		Frequency	Percent
	Never	50	19.8
	Sometimes	57	22.5
	Often	56	22.1
	Frequently	61	24.1
	Most of the time	29	11.5
	Total	253	100.0

Did not monitor the effects of the drug after administration.		**Frequency**	**Percent**
	Never	36	14.2
	Sometimes	71	28.1
	Often	47	18.6
	Frequently	63	24.9
	Most of the time	36	14.2
	Total	253	100.0

TABLE NO 14: Did not monitor the effects of the drug after administration.

TABLE NO 15: Did not record/report side or adverse effects

Did not record/report side or adverse effects.		Frequency	Percent
	Never	51	20.2
	Sometimes	63	24.9
	Often	44	17.4
	Frequently	65	25.7
	Most of the time	30	11.9
	Total	253	100.0

4.3.8 Did not record/report side or adverse effects

More than 25% of nurses frequently failed to record or report side effects or adverse reactions. This is a serious issue because timely reporting is essential for patient safety and future care decisions. If nurses do not document or communicate adverse effects, it can lead to delayed treatment, missed opportunities to adjust medication, or harm to patients. Contributing factors could include insufficient training, time constraints, or a lack of established procedures for adverse effect reporting. This is particularly problematic in high-pressure environments like those in Peshawar's healthcare settings.

TABLE NO 16: Did not check with a doctor before changing the route of administration.

Did not check with a doctor before changing the route of administration.		**Frequency**	**Percent**
	Never	57	22.5
	Sometimes	58	22.9
	Often	44	17.4
	Frequently	60	23.7
	Most of the time	34	13.4
	Total	253	100.0

4.3.9 Did not check with a doctor before changing the route of administration.

Changing the route of administration (e.g., from oral to intravenous) without consulting a doctor can lead to serious errors, as the prescribed route is often tied to specific drug effectiveness and patient safety considerations. Despite this, 23.7% of nurses frequently failed to check with a doctor before

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making such changes, which may suggest a lack of sufficient protocol enforcement or a tendency to act on their own judgment due to time constraints or emergency situations. This behavior increases the likelihood of medication errors and could be linked to stress or a lack of supervision.

TABLE NO 17: Did not check the patient's identity.

Did not check the patient's identity.		Frequency	Percent
	Never	55	21.7
	Sometimes	55	21.7
	Often	38	15.0
	Frequently	73	28.9
	Most of the time	32	12.6
	Total	253	100.0

4.3.10 Did not check the patient's identity.

Identifying patients correctly is critical for preventing errors. However, almost 43% of nurses sometimes or frequently fail to verify patient identities. This is a critical area where improvements in procedures and training can significantly reduce medication errors.

TABLE NO 18: Did not check the patient's chart.

Did not check the patient's chart.		Frequency	Percent
	Never	54	21.3
	Sometimes	52	20.6
	Often	39	15.4
	Frequently	73	28.9
	Most of the time	35	13.8
	Total	253	100.0

4.3.11 Did not check the patient's chart.

Checking a patient's chart before medication administration is crucial for ensuring correct drug, dose, and patient details. Despite this, nearly 43% of nurses sometimes or frequently did not check the chart, which could lead to administering the wrong medication, wrong dosage, or even the wrong patient. Factors like high patient volumes, heavy workloads, or inadequate access to updated patient charts could be contributing to this issue, particularly in healthcare facilities that might lack robust IT systems in Peshawar.

TABLE NO 19: Did not give relevant education and information to the patient (e.g., information sheet and/or clear expectation of procedure, side-effects, etc.)

Did not give relevant education and information to the patient (e.g., information sheet and/or clear expectation of procedure, side-effects, etc.)		**Frequency**	**Percent**
	Never	68	26.9
	Sometimes	58	22.9
	Often	36	14.2
	Frequently	58	22.9
	Most of the time	33	13.0
	Total	253	100.0

4.3.12 Did not give relevant education and information to the patient (e.g., information sheet and/or clear expectation of procedure, side-effects, etc.)

Giving patients proper information about their medication, expected effects, and side effects is essential for ensuring patient understanding and safety. However, over 22% of nurses frequently or

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sometimes failed to provide this information. Lack of time, insufficient resources, or poor communication skills could be contributing factors. In Peshawar, where healthcare facilities might face pressure due to high patient numbers, educating patients may not always be prioritized, despite its critical role in preventing medication errors.

TABLE NO 20: Did not observe the patient taking the medication.

Did not observe the patient taking the medication.		Frequency	Percent
	Never	51	20.2
	Sometimes	48	19.0
	Often	48	19.0
	Frequently	69	27.3
	Most of the time	37	14.6
	Total	253	100.0

4.3.13 Did not observe the patient taking the medication.

Observing the patient take medication ensures that it is ingested or administered correctly. However, 27.3% of nurses frequently did not observe the patient, and 19% sometimes failed to do so. This could lead to patients missing doses or incorrectly taking medication. High patient loads, limited staff, or a lack of structured protocols for medication observation might contribute to this issue. In busy healthcare settings like those in Peshawar, observation might be overlooked in favor of more immediate tasks, increasing the risk of errors.

The findings of the study highlight a mix of practices regarding medication administration and rule-bending among nurses in Peshawar. Despite some nurses adhering to protocols, a considerable portion reported engaging in practices that compromise patient safety, including medication errors and skipping verification steps. High workloads, insufficient resources, and time pressures appear to be significant contributing factors. To enhance patient safety, it is crucial to address these challenges by improving training, increasing staffing, and reinforcing adherence to protocols and communication standards.

In conclusion. The results on medication errors and rule-bending practices among nurses in Peshawar indicate a mixed picture, with a significant portion of nurses reporting occasional or frequent medication errors, including wrong drug administration, incorrect dosages, and patient identification issues. Additionally, many nurses admitted to engaging in rule-bending practices, such as not verifying unclear orders, skipping necessary documentation, or failing to check for allergies, which pose serious risks to patient safety. While some nurses consistently followed protocols, the prevalence of these errors and lapses suggests that high workloads, time pressures, and insufficient resources may be contributing factors. To improve patient safety, it is essential to enhance training, address staffing shortages, enforce protocol adherence, and improve communication within healthcare teams to reduce medication errors and ensure proper care delivery.

DISCUSSION

Our study shows that most nurses are young, with an average age of 29 years (range 23-44) and relatively few years of experience, averaging 5 years (range 1-20). The majority hold a BSN degree (70%), while fewer have a Post RN (24.1%) or MSN (5.5%). Many nurses reported making medication errors: 27.3% gave the wrong drug once or twice, 24.9% used the wrong route, and 28.9% frequently failed to check patient identity. Additionally, 31.6% sometimes or often did not verify unclear orders, and 29.6% sometimes failed to complete documentation. These issues may stem from high workloads, time pressures, and lack of resources. Improving training, communication, and adherence to protocols is essential for enhancing patient safety.

Both ponders highlight the critical issue of medicine organization blunders among medical caretakers, emphasizing components that contribute to these blunders. Within the ponder Adam Wondmieneh et.al (2020) (10) 68.1% of medical caretakers reported committing medicine blunders within the past year, with indicators counting insufficient

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preparing (AOR = 3.16), need of rules (AOR = 2.07), inadequately work encounter (AOR = 6.48), intrusions amid organization (AOR = 2.42), and night shifts (AOR = 5.0), all being factually noteworthy ($p < 0.05$). Additionally, our think about, numerous medical caretakers detailed mistakes such as giving the off-base sedate (27.3%), utilizing the off-base course (24.9%), and falling flat to check persistent character (28.9%). Variables like tall workload, time weights, and need of assets were recognized as contributing to these mistakes. Both considers emphasize the require for way better preparing, clearer conventions, and progressed work environment conditions to improve medicine security, as components such as insufficient preparing, work involvement, and intrusions are reliably related with higher mistake rates in both settings.

These studies shed light on the difficulties nurses encounter with regard to workload, prescription administration problems, and the influence of Electronic Medical Records (EMR) on clinical practice. inappropriate drug administration (27.3%), inappropriate routes (24.9%), and neglecting to verify patient identity (28.9%) were among the pharmaceutical errors that nurses in our study reported. These mistakes were caused by a number of factors, including heavy workloads, time constraints, and a lack of resources. Furthermore, our survey found that 29.6% of nurses occasionally missed documentation and 31.6% occasionally or frequently did not verify confusing orders, highlighting the need for improved protocol adherence, training, and communication. Raneen Naamneh et. al. (2024) (11), on the other hand, discovered that nurses believed EMR systems reduced workload (mean difference = -0.83, $p<0.001$) and medication errors (mean difference = -0.92, $p<0.001$) by an average of 30%. EMRs, however, were also thought to lengthen the time needed for paperwork, shorten the time needed for patient care, and make medical information 10% less accessible. This implies that although EMR systems can decrease workloads and increase medication safety, they have drawbacks, including longer documentation periods and sporadic information access issues. In order to lower medication errors and increase patient safety, both studies stress the significance of tackling systemic problems, whether through enhanced staffing and training, better procedures, or more efficient use of technology.

Both findings draw attention to important problems with medication administration and understanding in nursing practice. 55% of the 409 nurses (mean age 30.09 ± 4.45 years) in the study by Safia Alvi et.al. (2024) (12) had sufficient knowledge of resuscitation drugs; knowledge was positively correlated with age, experience, and specialized training (e.g., cardiovascular life support) ($P < 0.05$). Interruptions (75.6%), inadequate communication amongst medical staff (69.4%), and a reluctance to ask questions (67.7%) were the main obstacles to the safe delivery of medications. On the other hand, a considerable percentage of medication errors were found in our study, which focused on younger nurses with an average age of 29 and 5 years of experience. These errors included improper medicine (27.3%), incorrect routes (24.9%), and failure to verify patient identity (28.9%). High workloads, time constraints, and a lack of resources were blamed for these problems. In order to increase nursing knowledge and decrease medication errors, both studies stress the necessity of better training, communication, and protocol adherence. They also imply that addressing systemic issues and implementing educational interventions are crucial for enhancing patient safety.

Both findings highlight important gaps in nurses' medication delivery methods and expertise, which have a direct bearing on patient safety. 84% of the 2,363 registered nurses in the Muhammad Salman et.al. (2020) (1) study scored below 70%, indicating a lack of understanding of hazardous administration drugs (HAMs). Age, experience, and education did not appear to have a substantial effect on knowledge levels. Lack of available consultants (61.1%), verbal directions (55.6%), and unclear responses from coworkers (72.9%) were the main obstacles to safe medicine delivery. Similarly, a significant percentage of nurses reported making prescription errors in our study, which focused on younger nurses (average age of 29 years) with less years of experience (5 years on average). Among them were giving the incorrect medication (27.3%), taking the incorrect route (24.9%), and neglecting to verify the patient's identity (28.9%). Furthermore, 29.6% of nurses neglected to finish documentation, and 31.6% did

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not confirm directives that were ambiguous. Both studies emphasize the necessity of better training and communication as well as the significance of tackling systemic issues including heavy workloads, time constraints, and resource shortages. In order to improve nurses' knowledge and medication administration techniques and, ultimately, patient safety, our findings highlight the necessity of focused training interventions, improved protocols, and strengthened support networks.

Both studies demonstrate how important systemic and environmental elements are in influencing nurses' performance, especially in crucial environments like intensive care units. According to the Ishan Ullah et.al. (2023) (24) study, common barriers that impeded effective nursing practice included family distractions (62.82%), insufficient space in ICU patient beds (69.55%), delays in getting medications from the pharmacy (71.79%), and a lack of space for paperwork (57.69%). These problems were made worse by technological difficulties such as equipment shortages (52.56%) and the use of ill-maintained equipment (41.7%). ICU nurses' performance was found to be influenced by their age, gender, and area of specialization. In contrast, our study concentrated on younger nurses with less experience (5 years on average) and an average age of 29. who admitted to making serious prescription mistakes, such as giving the incorrect medication (27.3%), taking the incorrect route (24.9%), and neglecting to verify the patient's identity (28.9%). High workloads, time limits, and resource limitations were associated with these mistakes as well as problems like insufficient documentation (29.6%) and failing to validate confusing orders (31.6%). In order to improve patient safety, both studies emphasize the necessity of addressing systemic issues like a lack of resources, environmental constraints, and the influence of outside distractions. In order to assist nurses in providing the best care possible, they also stress the significance of improving training, communication, and procedure adherence.

CONCLUSION AND RECOMMENDATION

Conclusion:

Our study highlights the significant prevalence of medication administration errors among nurses, with factors such as high workloads, time pressures, inadequate training, and resource limitations being key contributors. The errors, including wrong drug administration, incorrect routes, and failure to verify patient identity, suggest that systemic issues in healthcare settings play a crucial role in affecting nursing practice. While our findings align with previous studies, they reinforce the need for urgent intervention to address these challenges and improve both the knowledge and practices of nurses, ensuring enhanced patient safety and quality care.

Recommendations:

To reduce medication administration errors, healthcare institutions should prioritize regular training programs focused on safe medication practices, especially for newer nurses with limited experience. Clear and standardized protocols for medication administration should be developed and adhered to, while work environments must be optimized to reduce distractions and improve efficiency. Additionally, the effective use of technology, such as Electronic Medical Records (EMRs), should be balanced with sufficient training to avoid increasing documentation time. Lastly, better communication and teamwork within healthcare teams, along with more manageable workloads, will be essential in minimizing errors and improving patient outcomes.

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